

Fig. 1

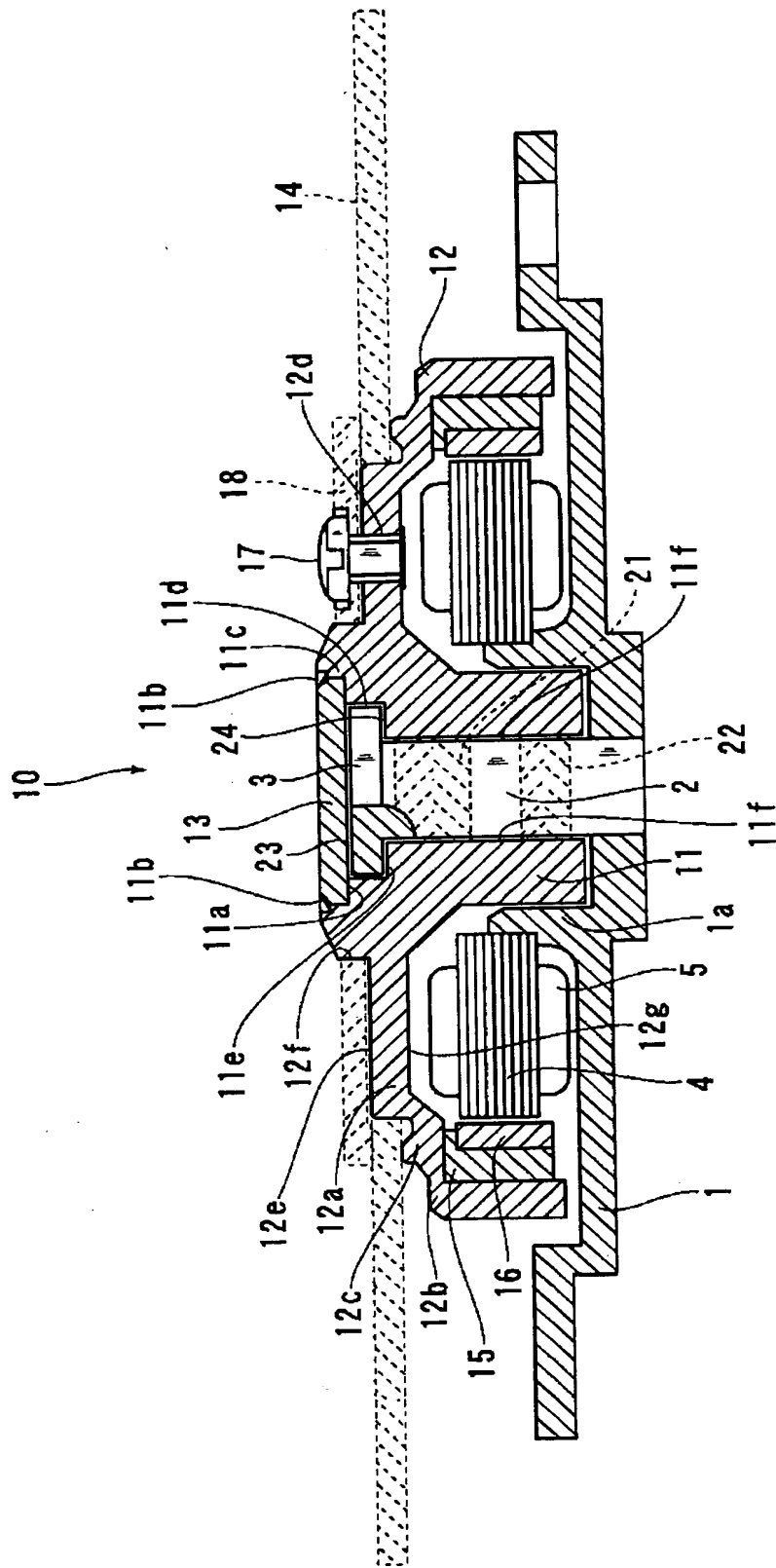


Fig. 2

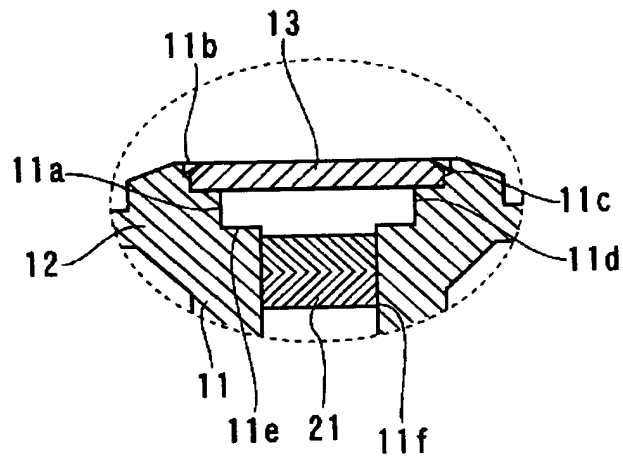


Fig. 3

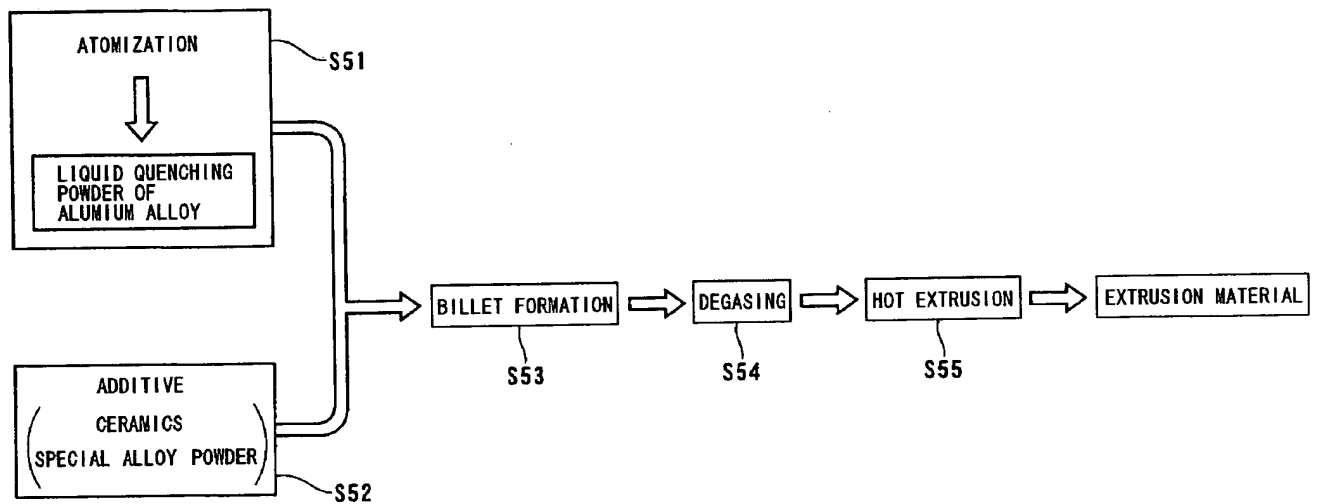
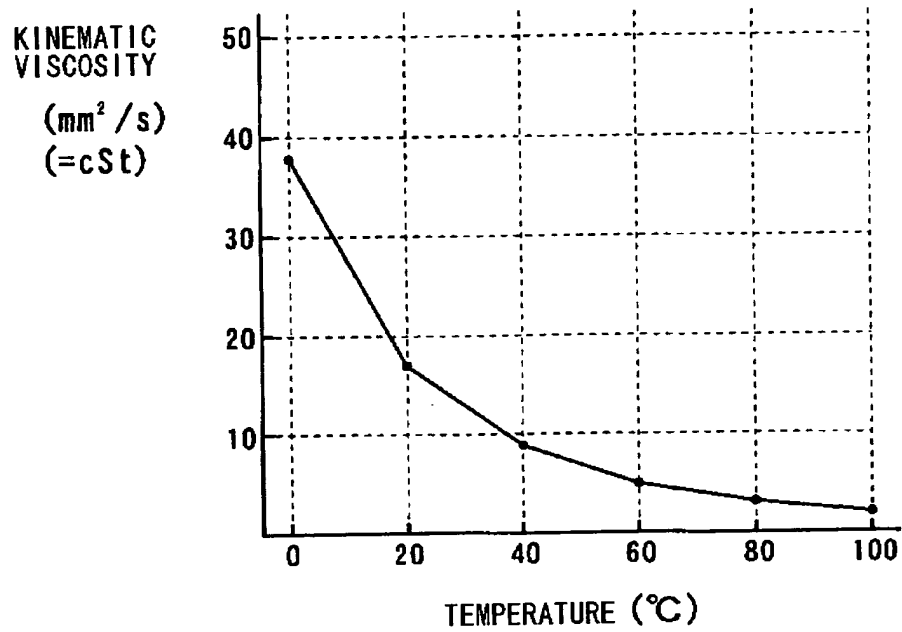


Fig. 4



(CHANGES IN OIL VISCOCITY WITH TEMPERATURE CHANGES)

Fig. 5

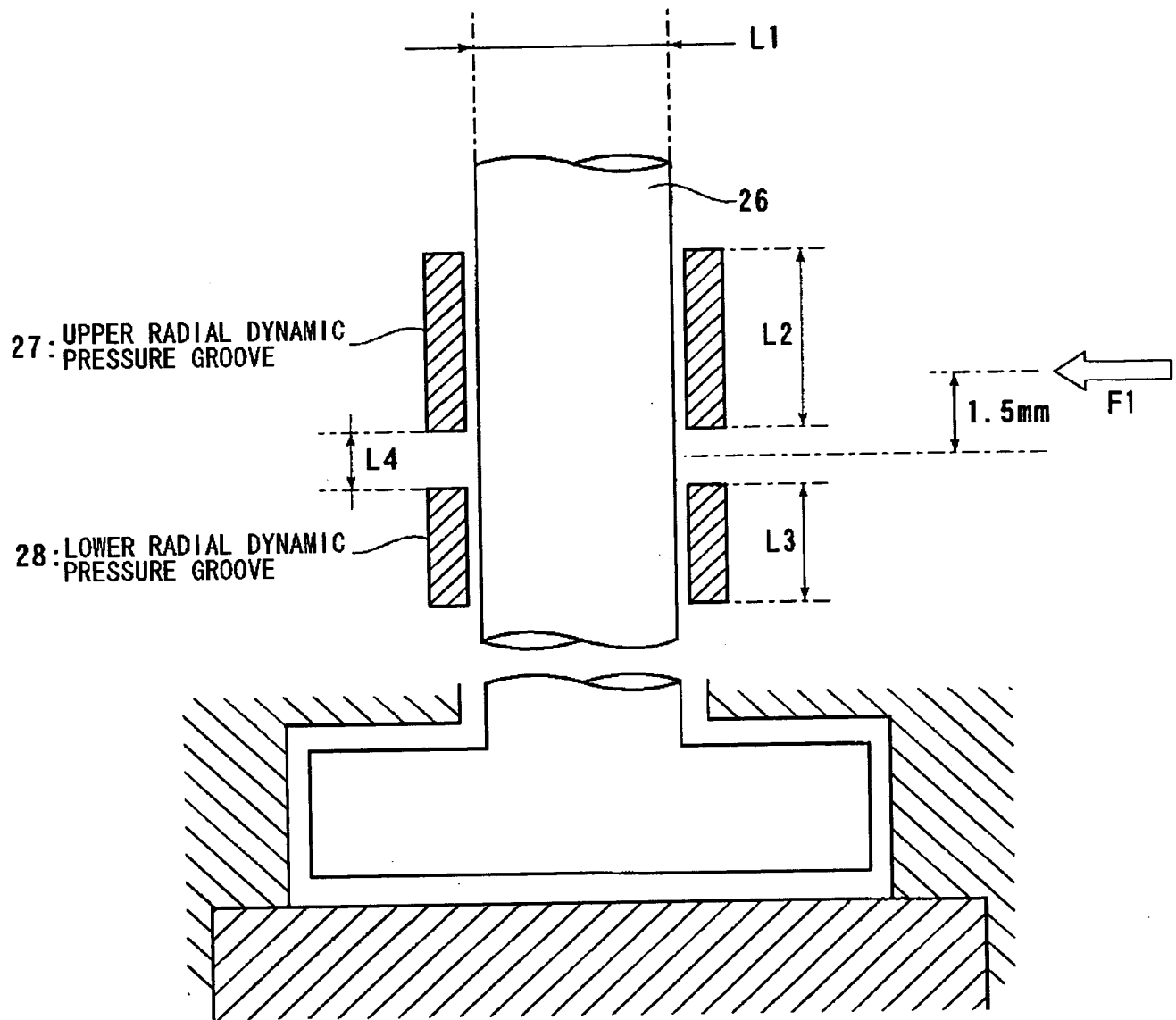


Fig. 6

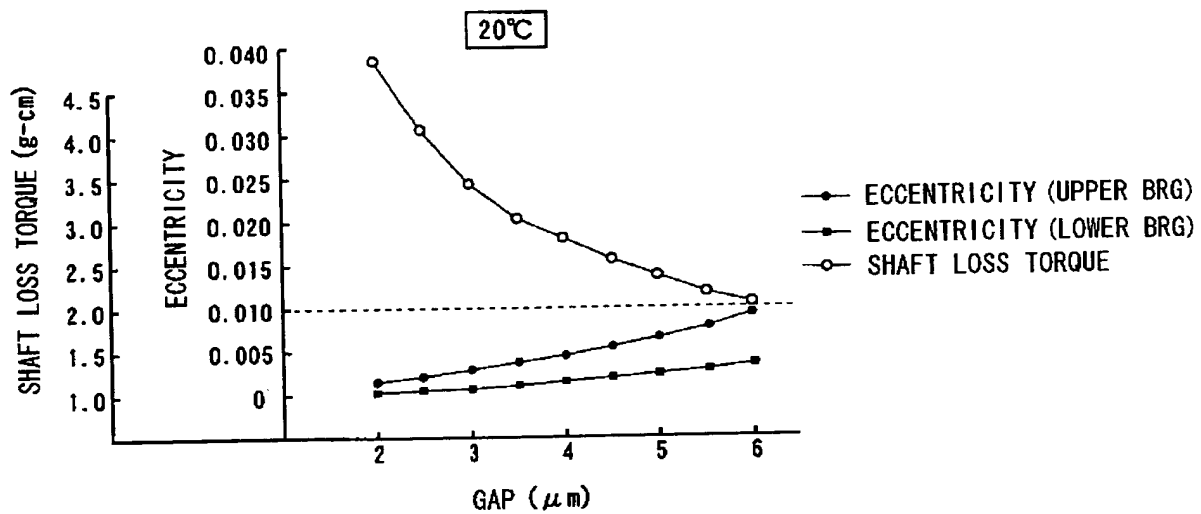


Fig. 7

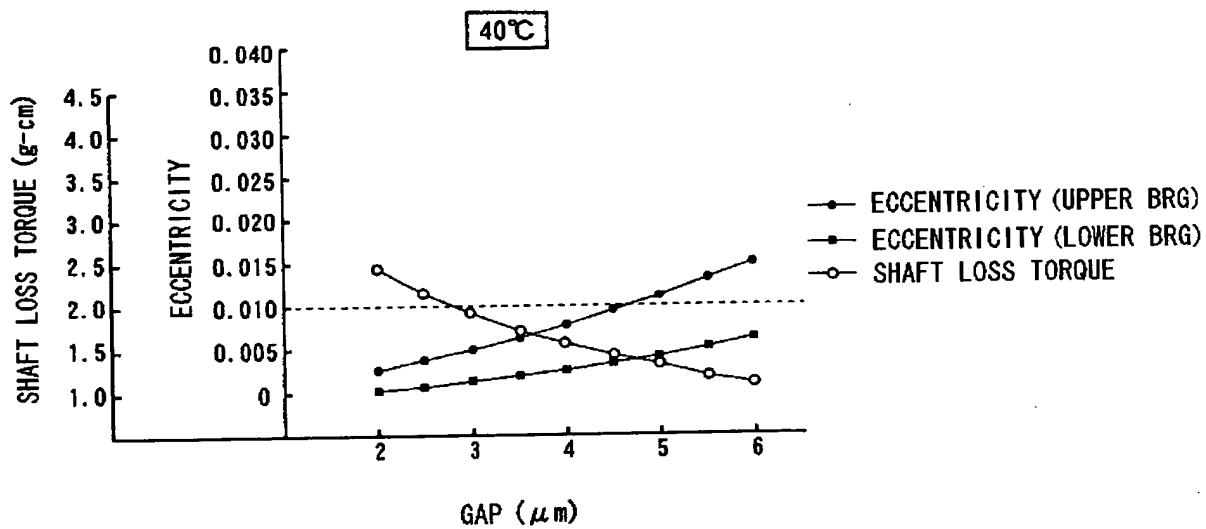


Fig. 8

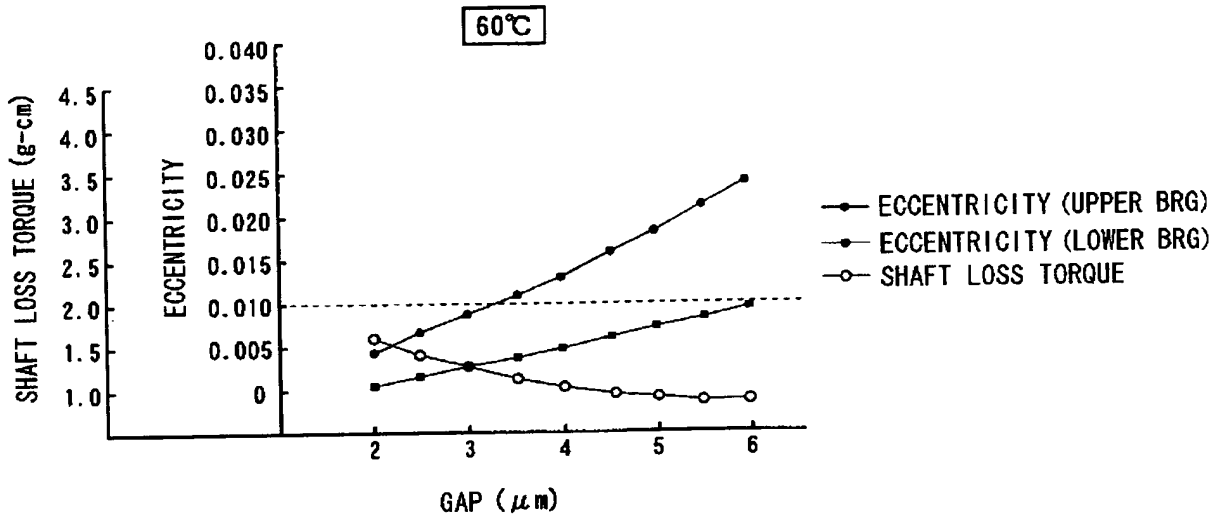


Fig. 9

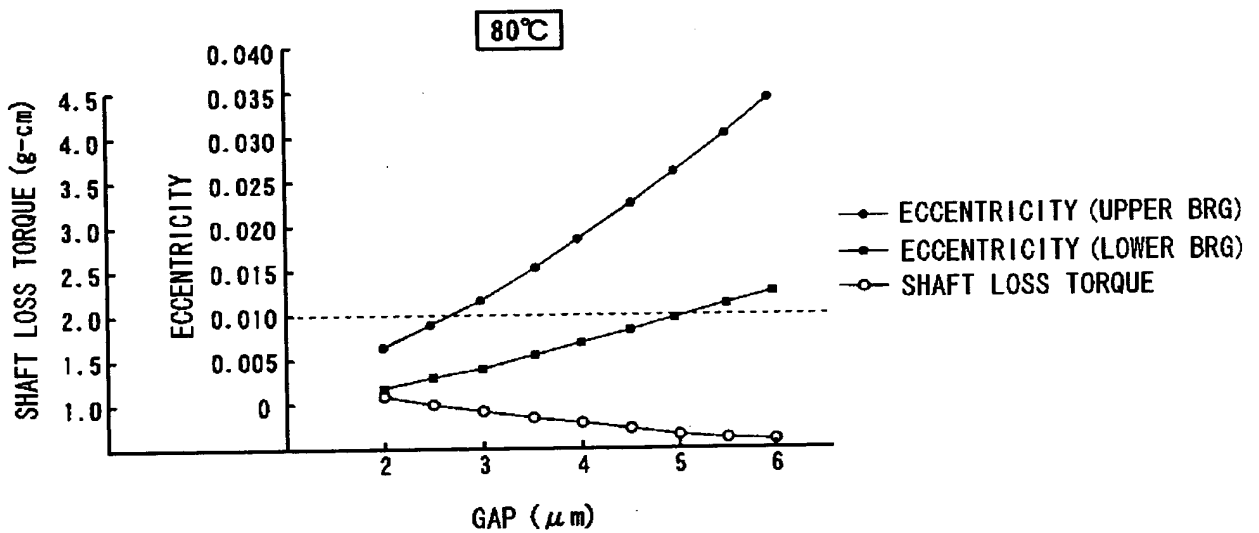


Fig.10

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## CHANGES IN GAP WITH TEMPERATURE CHANGES (SHAFT WITH DIAMETER OF 3mm)

SHAFT MATERIAL COEFFICIENT OF LINER EXPANSION ( $\times 10^{-6}$ )		SUS-300 TYPE 17.3	SUS-400 TYPE 10.3	ALUMIUM ALLOY OF PRESENT INVENTION 14.0	BsBm 19.1	Bronze 17.8
SLEEVE MATERIAL SUS-300 TYPE 17.3	TEMPERATURE					
	0	0	-0.4	-0.2	0.1	0
	20	0	0	0	0	0
	40	0	0.4	0.2	-0.1	0
	60	0	0.8	0.4	-0.2	0
	80	0	1.3	0.6	-0.3	-0.1
	100	0	1.7	0.8	-0.4	-0.1
SUS-400 TYPE 10.3	0	0.4	0	0.2	0.5	0.5
	20	0	0	0	0	0
	40	-0.4	0	-0.2	-0.5	-0.5
	60	-0.8	0	-0.4	-1.1	-0.9
	80	-1.3	0	-0.7	-1.6	-1.4
	100	-1.7	0	-0.9	-2.1	-1.8
ALUMIUM ALLOY OF PRESENT INVENTION 14.0	0	0.2	-0.2	0	0.3	0.2
	20	0	0	0	0	0
	40	-0.2	0.2	0	-0.3	-0.2
	60	-0.4	0.4	0	-0.6	-0.5
	80	-0.6	0.7	0	-0.9	-0.7
	100	-0.8	0.9	0	-1.2	-0.9
BsBm 19.1	0	-0.1	-0.5	-0.3	0	-0.1
	20	0	0	0	0	0
	40	0.1	0.5	0.3	0	0.1
	60	0.2	1.1	0.6	0	0.2
	80	0.3	1.6	0.9	0	0.2
	100	0.4	2.1	1.2	0	0.3
Bronze 17.8	0	0	-0.4	-0.2	0	0
	20	0	0	0	0	0
	40	0	0.4	0.2	0	0
	60	0.1	0.9	0.5	-0.1	0
	80	0.1	1.4	0.7	-0.2	0
	100	0.1	1.8	0.9	-0.3	0

※ VALUES IN TABLE ARE IN  $\mu\text{m}$

Fig. 11

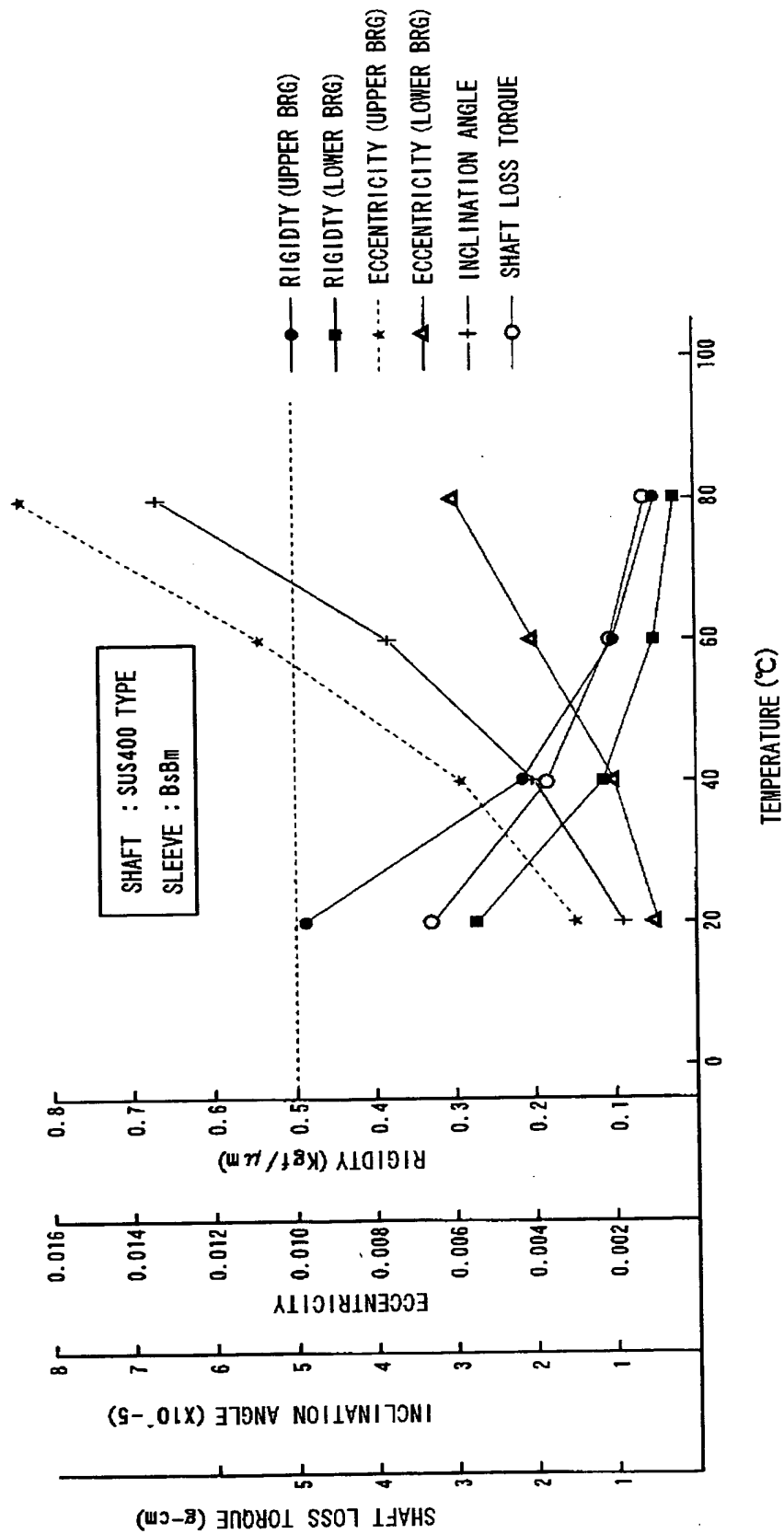




Fig. 12

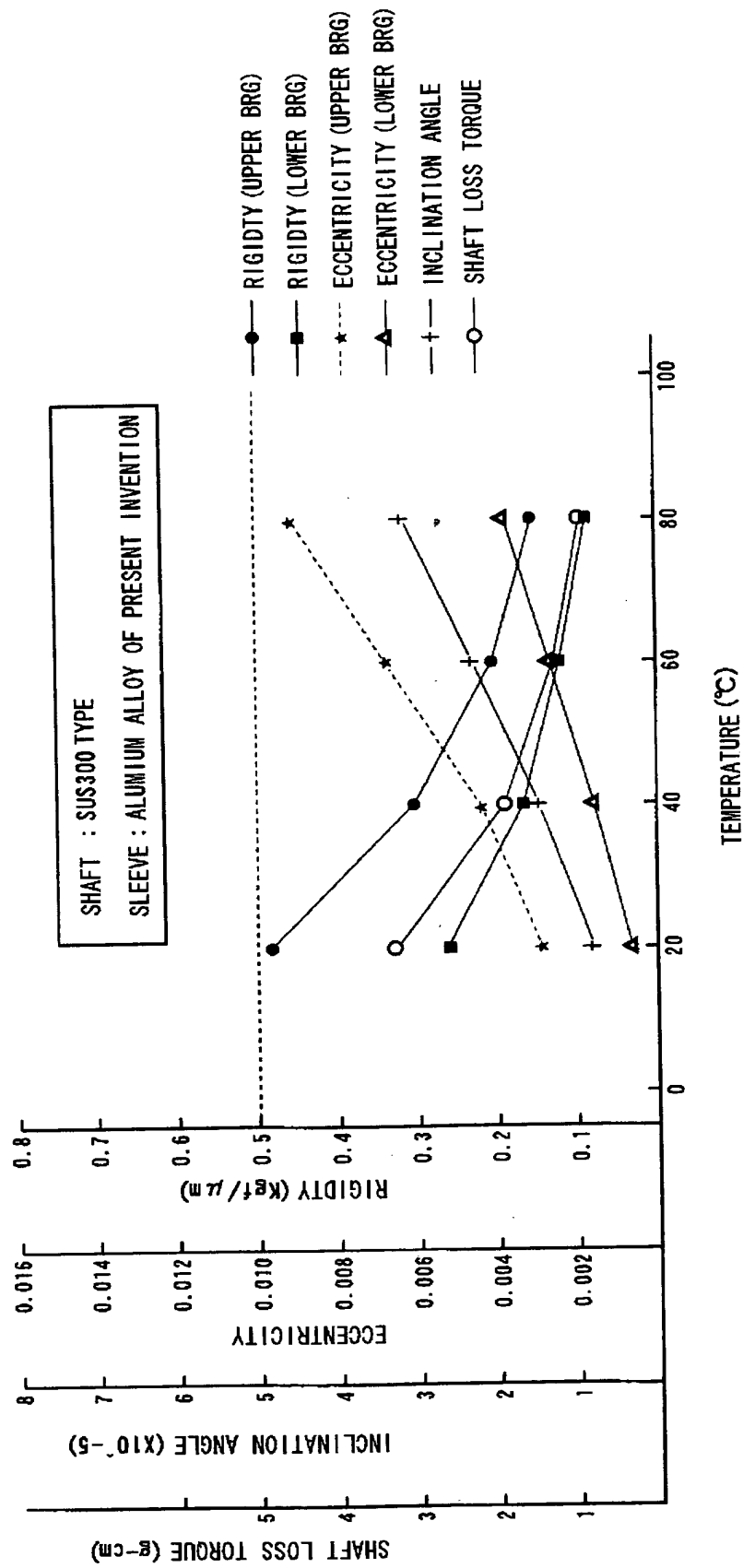


Fig. 13

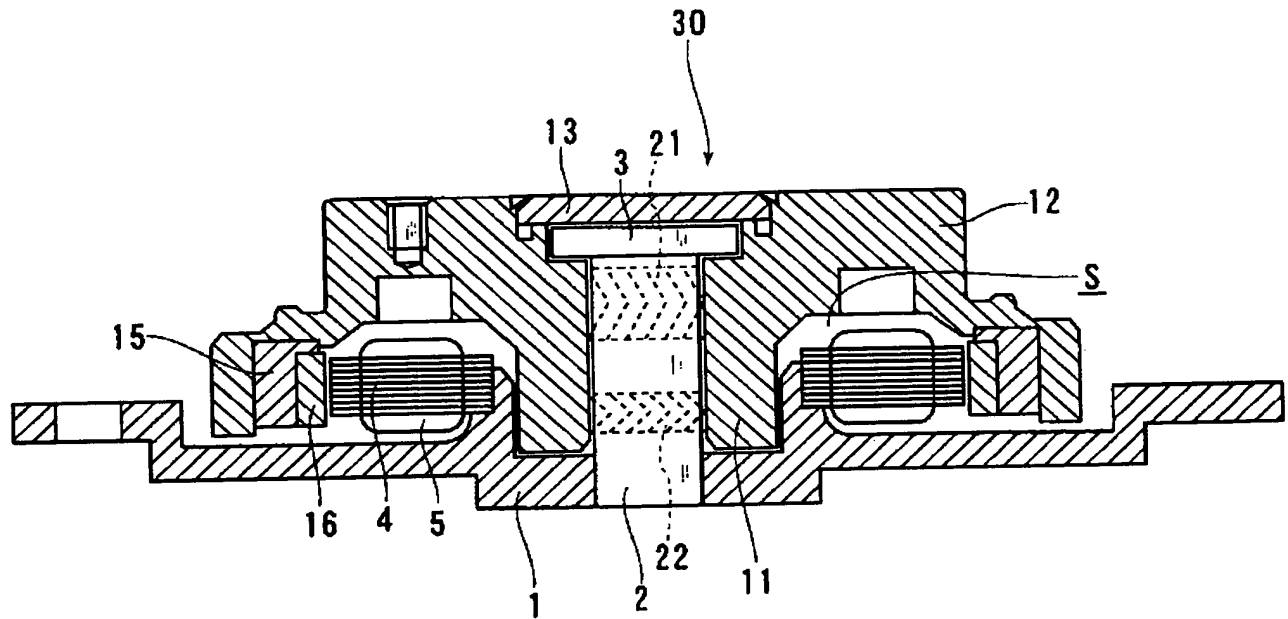


Fig. 14

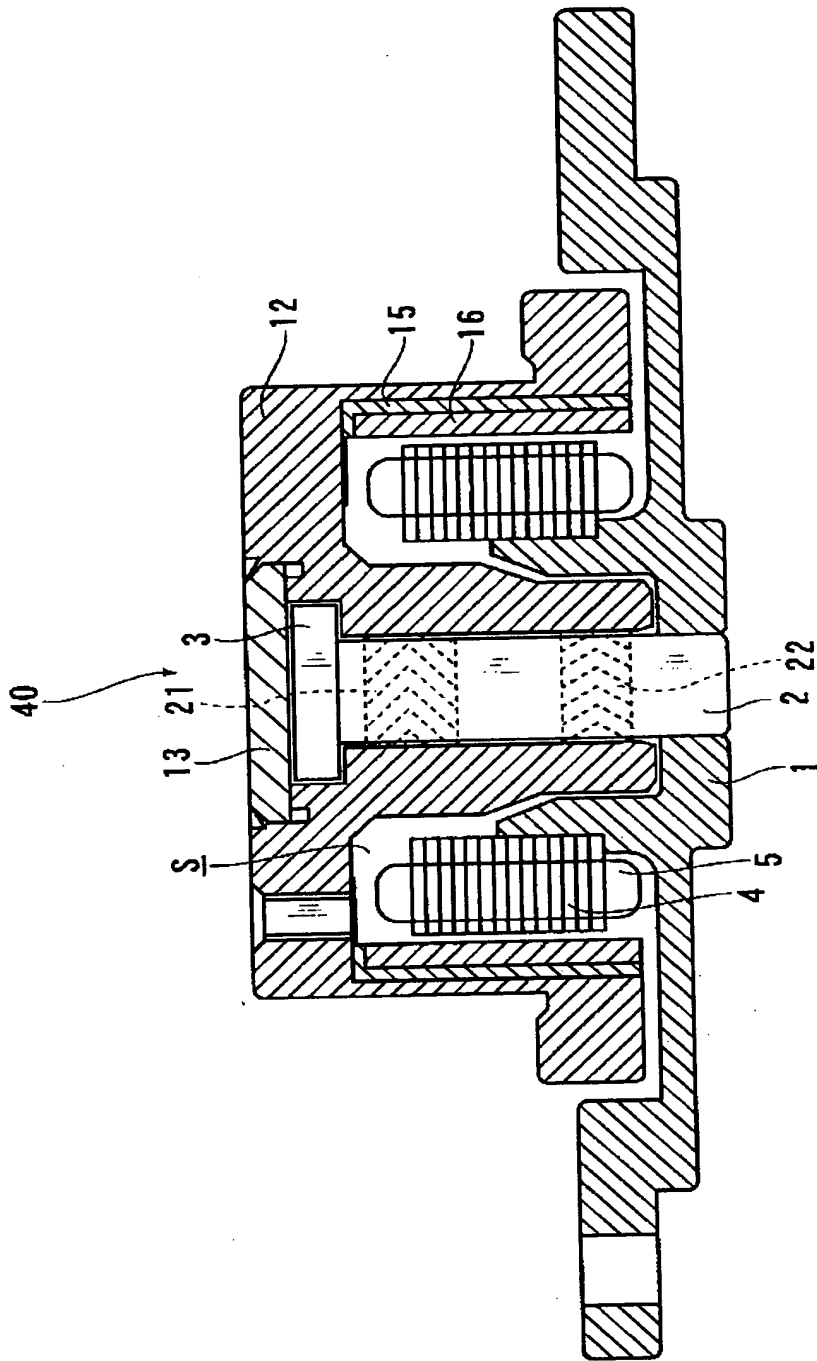


Fig. 15

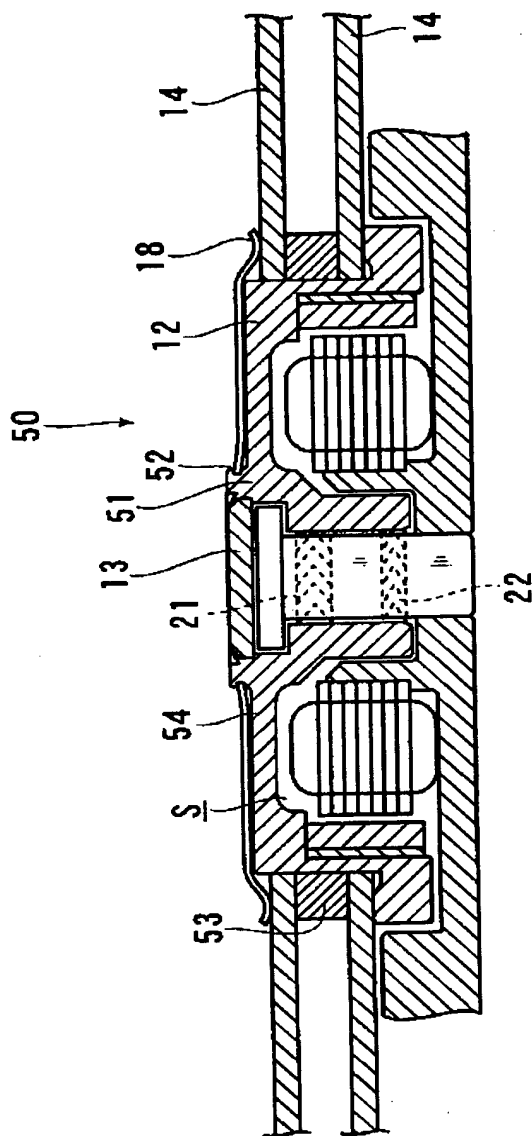


Fig. 16

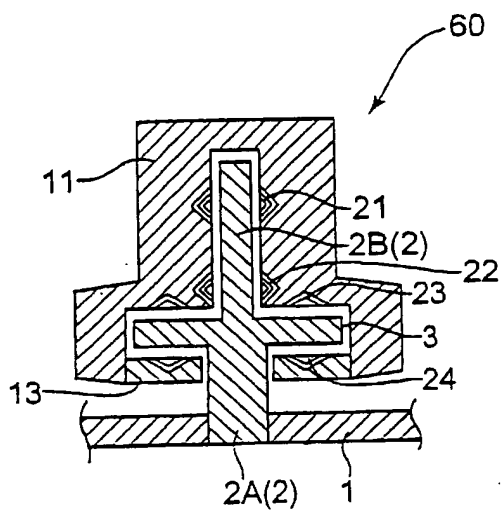


Fig. 17

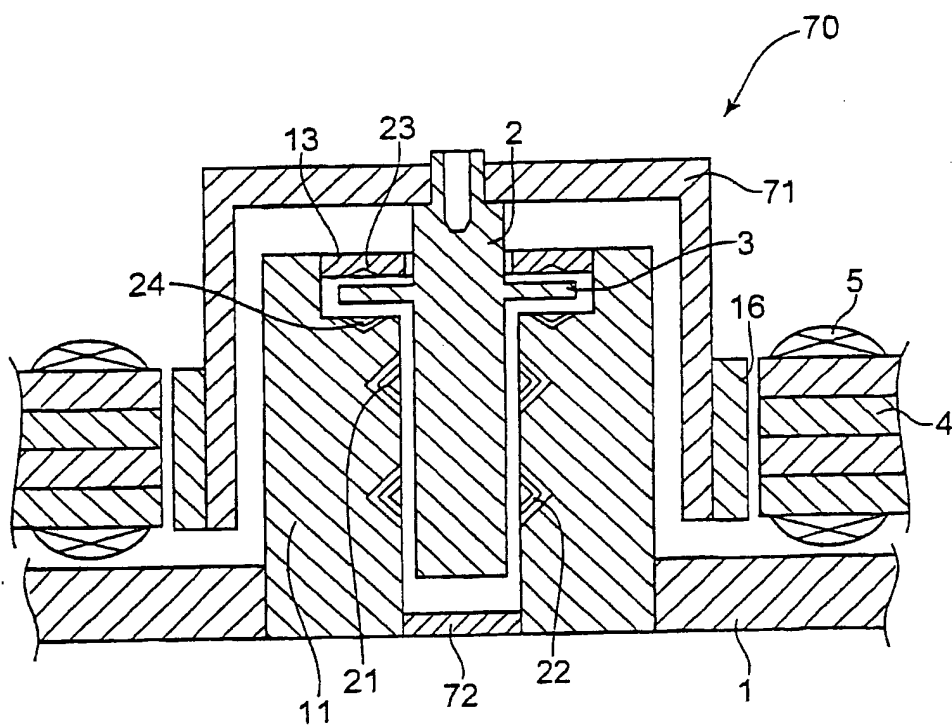
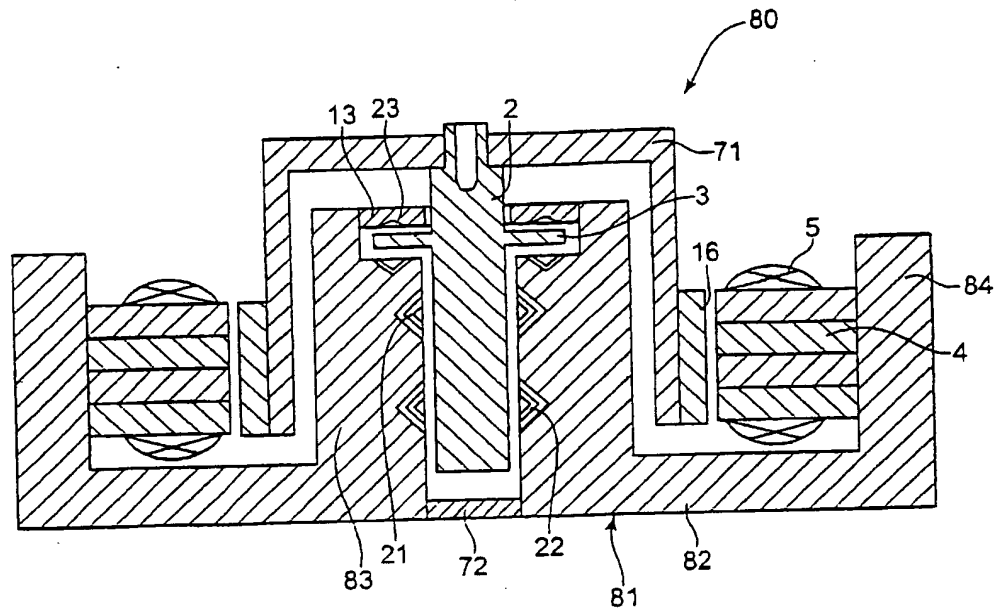


Fig. 18

(A)



(B)

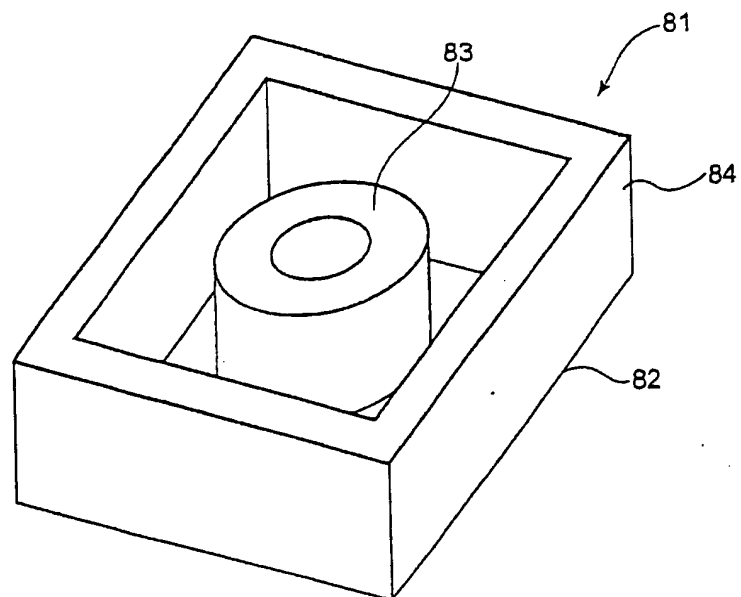


Fig. 19

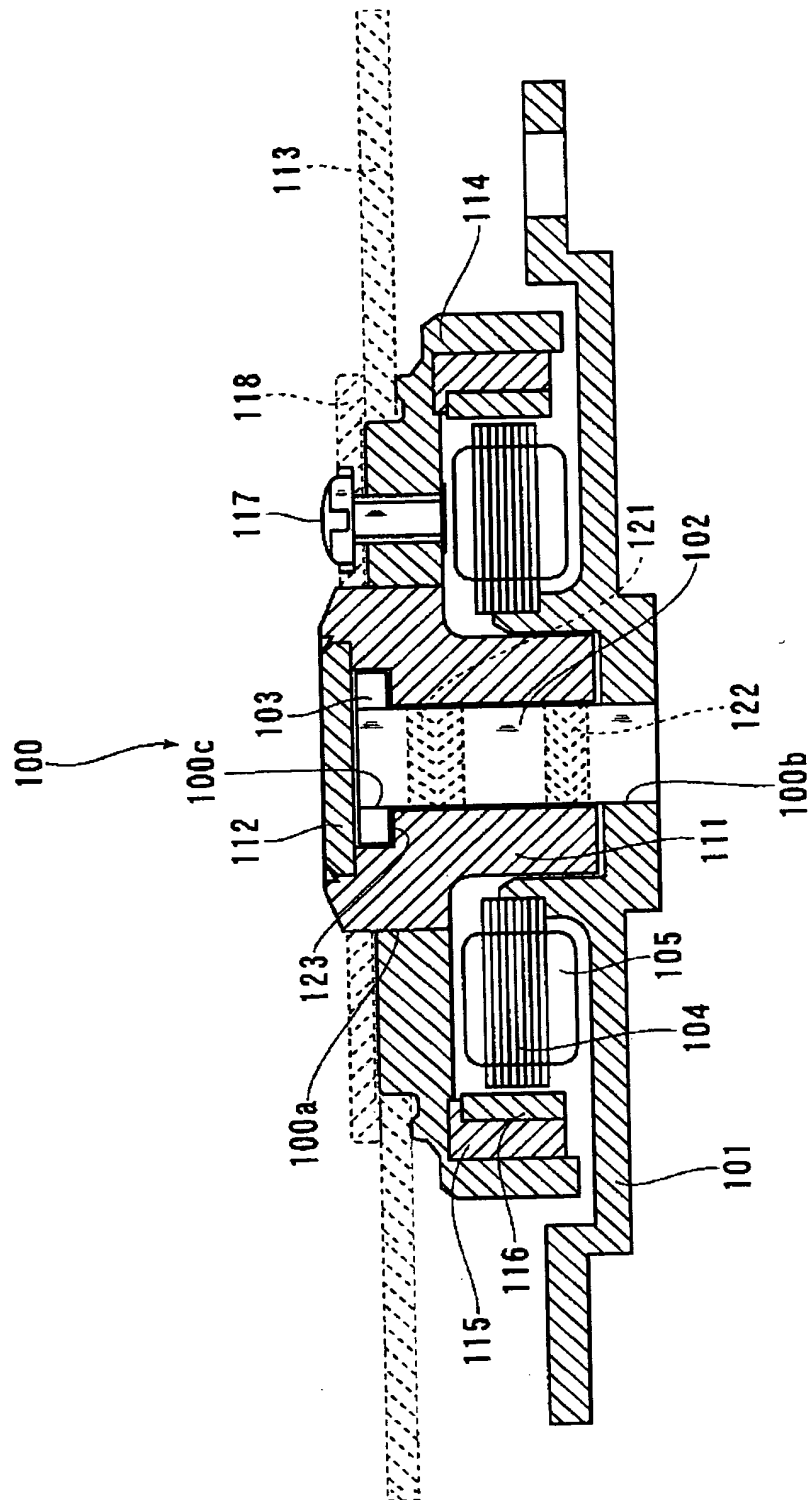


Fig. 20

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